CLAIMS

1. A dental handpiece for driving continuous rotation of a dental tool, said handpiece including a drive shaft (5) mounted to rotate in a longitudinal bore (2) of the handpiece and made up of a primary shaft (50) and a secondary shaft (51) which are coaxial, coupled together in series by torque limiter means (52) for limiting the maximum torque that can be transmitted, and provided with means for adjusting said maximum torque that can be transmitted, characterized in that the torque limiter means include:

- a male coupling portion constrained to rotate with the first shaft of the pair of shafts comprising the primary shaft (50) and secondary shaft (51), and having a coaxial annular outside surface (150),

- a female coupling portion (9) constrained to rotate with the second shaft of the pair of shafts comprising the primary shaft (50) and the secondary shaft (51), and having a coaxial annular inside surface (151) overlapping the coaxial annular outside surface (150) of the male coupling portion,

- a series of coupling cavities (23a, 23b) distributed annularly over the coaxial annular surface (151) of the first coupling portion of the pair of coupling portions comprising the male and female coupling portions,

- at least one rotary coupling member (15a, 15b) with a parallel rotation axis, mounted to slide radially in a transverse passage (14a, 14b) of the second coupling portion of the pair of coupling portions comprising the male and female coupling portions, and spring-loaded by spring means (17) toward the coaxial annular surface (151) of the first coupling portion of the pair of coupling portions comprising the male and female coupling portions so as to be partially engaged in said coupling

cavities (23a, 23b) whilst remaining guided in said transverse passage (14a, 14b).

2. A dental handpiece according to claim 1, characterized in that it includes at least two rotary coupling members (15a, 15b) mounted to slide radially in respective transverse passages (14a, 14b) regularly distributed around the longitudinal axis (I-I) to balance the radial forces of the rotary coupling members between the male and female coupling portions.

3. A dental handpiece according to either claim 1 or claim 2, characterized in that the rotary coupling member(s) are/is coupling balls (15a, 15b).

4. A dental handpiece according to any of claims 1 to 3, characterized in that the rotary coupling member(s) (15a, 15b) are/is mounted to slide radially in a respective transverse passage (14a, 14b) in the male coupling portion (50), and the coupling cavities (23a, 23b) are distributed annularly over the coaxial annular surface (151) of the female coupling portion (9).

5. A dental handpiece according to any of claims 1 to 4, characterized in that it includes means (20-22) for adjusting the force of the spring means (17) spring-loading the rotary coupling member(s) (15a, 15b).

6. A dental handpiece according to any of claims 1 to 5, characterized in that:

- the coupling cavities (23a, 23b) are longitudinal grooves with a circular arc-shaped cross section and a depth varying in the longitudinal direction,

- relative longitudinal position adjustment means (24-26) accessible to the user are provided for adjusting the relative longitudinal position of the male coupling portion (50) in the female coupling portion (9),

so that the rotary coupling member(s) (15a, 15b) engage(s) in deeper or shallower portions of the coupling cavities (23a, 23b) as a function of the chosen relative

longitudinal position, which determines the maximum torque that can be transmitted.

7. A dental handpiece according to any of claims 1 to 6, characterized in that the transverse channels (14a, 14b) are oriented in radial directions.

8. A dental handpiece according to any of claims 1 to 6, characterized in that the transverse passage(s) (14a, 14b) are/is oriented obliquely to the radial directions.

9. A dental handpiece according to any of claims 1 to 8, characterized in that:

- the male coupling portion is constituted by the distal end of the primary shaft (50),

- the female coupling portion is a coupling ring (9) mounted to overlap the adjacent ends of the primary shaft (50) and the secondary shaft (51), and coupled to the secondary shaft by rotation-preventing means (8a, 8b, 53),

- the distal end of the primary shaft (50) includes transverse passages (14a, 14b) for guiding coupling balls (15a, 15b),

- the distal end of the primary shaft (50) includes an axial bore (16) into which the transverse passages (14a, 14b) open,

- a bearing portion (18) is mounted to slide axially in said axial bore (16) and has a frustoconical part (19) in contact with the coupling balls (15a, 15b) to urge them radially outward,

- a compression spring (17) is engaged axially between the bearing member (18) and a calibration screw (21) itself functionally engaged in a screwthreaded section of the axial bore (20).

10. A dental tool according to claim 9, characterized in that:

- the coupling ring (9) is slidably mounted on the

proximal end of the secondary shaft (51), and includes coupling cavities (23a, 23b) in the form of longitudinal grooves whose depth varies in the longitudinal direction,

- the coupling ring (9) is freely rotatable and is constrained to move in axial translation with an adjuster ring (25) itself slidably mounted on the handpiece body to be directly accessible to the user.

11. A dental tool according to any of claims 1 to 10, including a main handpiece body, a handpiece neck (1) and a handpiece head (30), characterized in that the torque-limiter means (52) are housed in the neck (1) of the handpiece.

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